

WHAT IS CLAIMED IS:

1. A method for balancing a spindle assembly comprising steps of:
measuring an imbalance of the spindle assembly
5 and eccentric rings preassembled with the spindle assembly; and
dynamically balancing the spindle assembly by adjusting the eccentric rings based upon the measured imbalance of a combined
10 structure of the spindle assembly and the eccentric rings.
2. The method of claim 1 wherein the imbalance of the spindle assembly and the eccentric rings is
15 measured with the rings in a dynamically balanced position.
3. The method of claim 1 wherein the eccentric rings have different diameter dimension and are
20 supported in radially concentric alignment.
4. The method of claim 1 wherein the step of adjusting the eccentric rings comprises the step of:
rotating a spindle of the spindle assembly while
25 engaging one of the eccentric rings to adjust alignment of the one of the eccentric rings to dynamically balance the spindle assembly.

-20-

5. The method of claim 4 wherein the spindle is rotated by a head having at least one head pin adapted for insertion into a bore of the spindle and comprising the steps of:

- 5 inserting the at least one head pin into the
 bore of the spindle to engage the spindle;
 and
 rotating the head to rotate the spindle.

- 10 6. The method of claim 5 and further comprising the steps of:

- measuring alignment of the spindle; and
 rotating the head prior to inserting the at
 least one head pin into the bore of the
15 spindle to align the at least one head pin
 relative to the bore of the spindle.

7. The method of claim 4 wherein the spindle assembly is coupled to a mounting plate connected to
20 a drive chassis and the step of engaging the one of the eccentric rings comprises:

- inserting a probe through an opening in the
 mounting plate to engage the one of the
 eccentric rings.

25

8. The method of claim 4 wherein the eccentric rings include a first eccentric ring and a second eccentric ring and comprising the steps of:

- aligning a probe relative to the first eccentric
30 ring and engaging the first eccentric ring;

-21-

rotating the spindle to adjust the first
eccentric ring;

withdrawing the probe from the first eccentric
ring;

5 aligning the probe relative to the second
eccentric ring and engaging the second
eccentric ring; and

rotating the spindle to adjust the second
eccentric ring.

10

9. The method of claim 5 and further comprising the
step of:

15 inserting opposed spindle pins into openings on
opposed ends of a spindle portion having
the spindle rotatable thereabout to support
the spindle assembly for balancing.

10. The method of claim 1 wherein the measured
imbalance is recorded on a device tag and further
20 comprising the step of:

downloading the measured imbalance to a
controller to adjust the eccentric rings
based upon the measured imbalance.

25 11. The method of claim 9 wherein one of said
spindle pins extends through a channel of the head
and is biased in an extended position and comprising
the step of:

-22-

retracting the spindle pin in the channel of the head against the bias to engage the head with the spindle for rotation.

5 12. The method of claim 7 wherein the probe is supported on a lift coupled to an axial slide and comprising the steps of:

operating the slide to move the probe to selectively align with first and second
10 eccentric rings; and

operating the lift to raise the probe to engage the first and second rings and lower the probe to disengage the first and second rings.

15

13. A method for balancing a spindle assembly comprising the steps of:

measuring an imbalance of a spindle assembly including an eccentric ring; and
20 dynamically balancing the spindle assembly by adjusting the eccentric ring based upon the measured imbalance of the spindle assembly and the eccentric ring.

25 14. The method of claim 13 wherein the step of adjusting the eccentric ring comprises the step of:

rotating a spindle of the spindle assembly while engaging the eccentric ring to dynamically balance the spindle assembly.